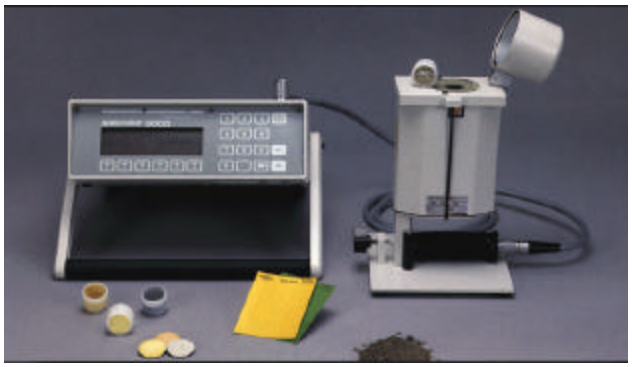
Technology Demonstration Summary Sheet
Portable X-Ray Fluorescence Detector

THE NEED

Hidden or abraded non-radioactive contaminants such as lead or heavy metals may exist in nuclear facilities undergoing decontamination and decommissioning (D&D). Typical practice is to extract samples for off-site laboratory analysis. This can be a costly and time consuming process. If the contaminant determinations could be made in-situ, the cost and time could be reduced substantially.

THE TECHNOLOGY

The portable Spectrace 9000 unit (TN Spectrace) provides for non-destructive, real-time elemental analysis for solid, liquid, thin film, and powder samples. The system collects x-ray emission spectra from a sample after excitation with one or more radiation sources. The system analyzes elements of atomic number 11 and higher, at concentrations from a few parts per million to percent levels.



Spectrace 9000 Equipment

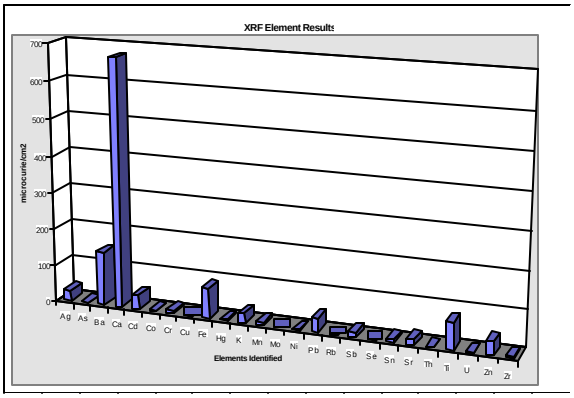
THE DEMONSTRATION

This demonstration , performed in August 1996, involved the field use of the element detection capabilities of the Spectrace 9000 in the CP-5 Reactor Mezzanine Area. The detector was used in conjunction with a demonstration of the Accelerated Facility Characterization Process. The demonstration was conducted at the Argonne National Laboratory CP-5 Reactor D&D Project as part of the Large Scale Demonstration Program funded by DOE's Federal Energy Technology Center.

The demonstration used a combination of X-ray fluorescence (XRF) equipment and traditional portable radiation detection equipment to test an improved characterization approach and to develop characterization data from three rooms in the CP-5 reactor.

THE RESULTS

The XRF identified 25 elements quantitatively. Elevated levels of lead-based paint were found in portions of the demonstration area. These levels will require remediation action upon final site decommissioning. Concentrations of other elements were below levels of concern.



Measurement Results for CP-5 Mezzanine Area

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